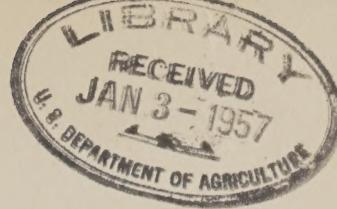


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Issued January 31, 1908.

## United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Seed and Plant Introduction and Distribution,

WASHINGTON, D. C.

### DISTRIBUTION OF COTTON SEED IN 1908.

The present will be the sixth distribution of cotton seed carried on by this office with the cooperation of the cotton investigators of the Bureau of Plant Industry.

During the past four years distribution has been made of thirty-two varieties of cotton, every one of which was carefully selected by Dr. Herbert J. Webber, formerly of this Department, and his assistants because of special local value.

From the reports so far received it is evident that as a rule the seed sent out by the Department of Agriculture was better than that commonly grown. The distribution of the present year will add six varieties to those previously distributed.

In general the Department will not duplicate the distribution of a variety, so that those who are pleased with the variety sent this year are urged to save their own seed.

LISLE MORRISON,  
Assistant in Charge.

Approved:

B. T. GALLOWAY,  
*Chief of Bureau.*

WASHINGTON, D. C., January 23, 1908.

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## DISTRIBUTION OF COTTON SEED IN 1908.

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### PLAN OF DISTRIBUTING THE VARIETIES.

For a number of seasons the Bureau of Plant Industry has distributed small quantities of cotton seed to growers. The object of this distribution is to furnish them with seed of new varieties to test in comparison with those they already grow, and thereby enable them to select the varieties best suited to their soil and climatic conditions.

In selecting the seed for distribution it is proposed so far as possible to select new and little-known varieties which have proved valuable in certain localities and distribute the seed in such a way as to insure its being generally tested throughout the Cotton States. No variety is chosen until the representatives of the Department of Agriculture have informed themselves by observation of its sterling qualities in its present range and of its promise of value in the regions to which it is sent. Considerable work has been done by the agents of the Department in the improvement of the varieties of cotton by hybridization and selection. It is believed that a number of new strains which have been developed as a result of this work will be valuable, and some of them are included in this distribution this season.

The presence of the boll weevil and the resulting strict quarantine which various States have established against seed which might be infected has made it necessary for the Bureau of Plant Industry to establish a breeding laboratory within the boll-weevil region. This laboratory is located at Waco, Tex., and all varieties bred especially for weevil conditions are distributed from that place. It is not possible to send seed of any variety distributed from Waco outside the weevil-infested territory.

Approximately one-fifth of the total quantity of seed distributed is reserved as the quota of the Secretary of Agriculture, which is distributed at large throughout the cotton belt. The remaining four-fifths is equally apportioned among the Senators and Representatives from the cotton-growing section.

It is intended at the end of the season to follow up each package of seed with a circular in order to obtain information in regard to the

adaptability of the several varieties to the sections in which they were distributed.

Growers receiving the seeds are urged to cooperate with the Department of Agriculture by making a careful test of the seed distributed in comparison with the varieties already being planted and to adopt them wherever they prove to be better adapted to existing conditions than the older varieties. The active and earnest cooperation of growers in this matter is especially desirable in view of the fact that there is no crop comparable in importance to the cotton crop in which so little attention is paid to the quality of seed planted. It is certain that a majority of cotton growers are annually sustaining a very heavy loss as a result of the inferior quality of seed which they plant. There can be no doubt that many farmers are growing varieties which are not as well adapted to their particular conditions as some other available varieties.

Comparative tests of varieties of cotton as made by the various Southern agricultural experiment stations and by the Department of Agriculture show a great difference in their productiveness. In a variety test made by Professor Duggar at the Alabama Agricultural Experiment Station in 1904, where thirty-eight of the standard varieties were grown, the yields ranged from 378 to 628 pounds of lint cotton to the acre. In a similar test made by the Department of Agriculture in 1905 at McColl, S. C., where 36 of the standard varieties were grown under as nearly uniform conditions as it seems possible to obtain, the yields ranged from 1,575 to 2,850 pounds of seed cotton to the acre. No doubt most of the varieties tested are good varieties well adapted to certain localities and soil and climatic conditions, but it is certain that none of them is adapted to all conditions and localities, and the above figures strikingly demonstrate how important it is for each grower to plant the variety which is best adapted to his particular conditions. The best practical way to determine this is for each grower to test the varieties on a small scale for himself under his existing conditions.

No doubt another source of loss to very many growers is the fact that they follow no systematic method of seed selection. A much greater loss than is realized is due to the number of unproductive plants found in almost every field. Frequently plants equally supplied with space and food differ very much in their productiveness, and these differences are often inherited. In examining an average cotton field a very few extra good plants will usually be observed, and a great many ordinary plants and a large number of very inferior ones will also be found. There are usually more poor than good ones. Almost everyone will concede that seed from good plants will very likely produce other good plants, while seed from poor plants will

just as surely produce other poor plants. As a rule cotton growers pay no attention to the character of the stalks from which their planting seed comes. They have everything in the field picked together. They get planting seed from the poor plants as well as from the good ones, and as there are more poor plants than good ones they get more seed from them than from the good ones. Consequently the poor plants are propagated more rapidly than the good ones and thus any variety gradually degenerates under this system. But, on the other hand, if a careful system of selection is followed by which only the best plants are selected and all of the inferior ones eliminated each year it should be reasonably expected that the number of poor plants would rapidly diminish and the variety become correspondingly more productive.

In view of the foregoing conclusions and in consideration of the great opportunity for growers to increase their profits by a careful system of seed selection, the following suggestions with reference to the methods of selection are presented.

#### METHODS OF SEED SELECTION.

There are two well-defined methods of selection which can be practiced, and these may be called "general" and "individual." Most of the improvement of cotton in the past has been by the former of these methods, but the latter brings much quicker and more marked results. In a general selection the planter takes a bag and goes over his field selecting carefully his best plants and picking from them into the bag. In this way he selects enough to plant the crop the next year, when the same process is repeated. This method is much better than no selection and in the hands of about one man in a thousand is capable of giving good yearly gains, but its weakness is based on the fact that cotton stalks, like men, may make a good showing because they have inherent good qualities or because they have some advantage in opportunity above their fellows. Probably no planter ever becomes so expert that he will always be able to know whether a certain stalk is good because of something in the stalk or because of something in its special soil, fertilizer, or cultivation.

In an individual selection, the planter selects a certain number—10, 25, or 50—of the best stalks he has, as near to the same ideal as he may, but instead of picking them all into one bag he tags each plant with a number and picks its seed cotton into a separate paper bag bearing the number of the plant. It is too tiresome a piece of work to delint these 50 samples by hand, so it is planted next year without delinting, a row to a plant. This plot of ground should be as near uniform as possible. This gives each plant selected a chance to show what is inherent in it and what is accidental. The next year the

planter selects the one or more rows which come nearest to his ideal of the year before, and he selects 2, or 20, or 50 plants from these rows to repeat the process the third year. The remainder of the seed cotton from these good rows will be enough to have ginned, and this will give him a start for his whole plantation.

To illustrate the advantage to be gained by individual selection we may take the result of a trial made by the Department of Agriculture in 1905 at Paris, Tex. Sixteen plants of a variety called Hagaman were selected in 1904 and a general selection of about the same quantity of seed was made at the same time from the same field. These 16 plants were all planted a row to a plant, and the general select seed was planted immediately adjoining. The season of 1905 in northern Texas was a very hard one and all the yields were small, but the results illustrate the point as well as with larger yields.

The general selections yielded 400 pounds of seed cotton to the acre, and each row yielded about the same as its neighbor.

The 16 rows of individual selections taken together yielded about 450 pounds of seed cotton to the acre, but the individual rows ranged from 216 pounds to 770 pounds per acre. Taking the six highest yielding rows we find that they gave a yield of 615 pounds per acre. This instance then shows a gain of about 50 per cent in favor of individual selection. The general selection plot had no more bad plants in it than the individual selection, but in one plot they were mixed all through and in the other they were separated into rows, and were very readily discarded.

#### DISTRIBUTION OF VARIETIES BY STATES AND CONGRESSIONAL DISTRICTS.

##### ALABAMA.

Districts 1 and 2-----	Keenan and Pride of Georgia.
3 and 4-----	Keenan and Pride of Georgia.
5, 6, and 7-----	Lewis Prize Prolific and Pride of Georgia.
8 and 9-----	Lewis Prize Prolific and Pride of Georgia.

##### ARKANSAS.

Districts 1 and 2-----	Lewis Prize Prolific and Pride of Georgia.
3 and 4-----	Peterkin and Lewis Prize Prolific.
5, 6, and 7-----	Lewis Prize Prolific and Pride of Georgia.

##### FLORIDA.

District 1-----	Columbia and Peterkin.
2 and 3-----	Columbia and Peterkin.

##### GEORGIA.

Districts 1, 2, and 3-----	Columbia and Lewis Prize Prolific.
4, 5, and 6-----	Peterkin and Columbia.
7, 8, and 9-----	Peterkin and Columbia.
10 and 11-----	Peterkin and Keenan.

## LOUISIANA.

Districts 3 and 4----- Keenan and Southern Hope.  
 5, 6, and 7----- Triumph and Terrell.

## MISSISSIPPI.

Districts 1, 2, 3, and 4----- Peterkin and Columbia.  
 5 and 6----- Pride of Georgia and Keenan.  
 7 and 8----- Southern Hope and Lewis Prize Prolific.

## NORTH CAROLINA.

Districts 1, 2, and 3----- Pride of Georgia and Peterkin.  
 4, 5, and 6----- Pride of Georgia and Columbia.  
 7, 8, and 9----- Pride of Georgia and Columbia.

## SOUTH CAROLINA.

Districts 1 and 2----- Pride of Georgia and Keenan.  
 3 and 4----- Pride of Georgia and Columbia.  
 5, 6, and 7----- Columbia and Lewis Prize Prolific.

## TENNESSEE.

Districts 3, 4, and 5----- Pride of Georgia and Columbia.  
 6 and 7----- Lewis Prize Prolific and Columbia.  
 8----- Columbia and Pride of Georgia.  
 9 and 10----- Lewis Prize Prolific and Peterkin.

## TEXAS.

Districts 1 and 2----- Tring and Triumph.  
 3, 4, and 5----- Crenshaw and Tring.  
 6----- Tring and Triumph.  
 7, 8, and 9----- Terrell and Triumph.  
 10 and 11----- Tring and Triumph.  
 12 and 13----- Terrell and Triumph.  
 14, 15, and 16----- Terrell and Triumph.

## OKLAHOMA.

Districts 1 and 2----- Pride of Georgia and Lewis Prize Prolific.  
 3, 4, and 5----- Columbia, Lewis Prize Prolific, and Pride of Georgia.

## DESCRIPTION OF VARIETIES DISTRIBUTED.

## SHORT-STAPLE UPLAND VARIETIES.

## TERRELL.

(Distribution arranged by D. N. Shoemaker.)

The Terrell variety (fig. 1) is the result of selections made in 1904 at Terrell, Tex., in a field of Boykin's Stormproof cotton. One of the plants then selected showed itself to be of very different character from the parent variety, and it has kept its characters in a very marked degree to the present time. It has since been grown one year at Paris, Tex., and two years at Palestine, Tex.

The points of value of Terrell cotton are its earliness and its productiveness. It is also of a very strong constitution, being thrifty and continuing to set fruit until checked by frost, drought, or insects. The plants are decidedly hairy, and the mature stems usually have a purplish color.

It is hoped that Terrell cotton may find a place in the weevil region on account of its earliness. This variety is described as follows:

Plant of medium size, vigorous and prolific, having one to several basal branches; fruiting branches long, drooping, short jointed; bolls medium in size, ovate, with an obtuse point, opening well, moderately stormproof, 4 or 5 locked; seeds small, covered with a white fuzz; lint strong, 1 inch to  $1\frac{1}{2}$  inches, of typical Upland

FIG. 1.—Mature boll of Terrell cotton.

character; seeds well covered, giving 33 to 35 per cent of lint; season of maturing early.

The seed used in this distribution was grown in the season of 1906 by Mr. J. D. Kimbrough, of Palestine, Tex., under the supervision of the cotton laboratories of Cotton and Tobacco Breeding Investigations of the Bureau of Plant Industry.

## TRIUMPH.

(Distribution arranged by D. N. Shoemaker.)

The variety known as Triumph (fig. 2) was originated by Mr. A. D. Mebane, of Lockhart, Tex., who developed it from a single plant found in his general crop of 1899. It is supposed by him to be an accidental cross between the Boykin's Stormproof and the Peterkin cottons.

The valuable qualities of the Triumph variety are its stormproof character and its high percentage of lint. The large 5-locked bolls hold the seed cotton well all through the autumn despite winds and rains, and they are very easily picked.

Mr. Mebane's entire crop for several years has given an average of more than 38 per cent of lint, with occasional loads yielding 39 per cent or more; in other words, it takes only about 1,300 pounds of seed cotton to make a 500-pound bale of lint. The original cotton from which this variety was developed yielded only 24 to 35 per cent of lint. The staple is of good quality, averaging from 1 inch to  $1\frac{1}{2}$  inches in length and in some plants reaching  $1\frac{1}{4}$  inches, and it generally ranks a little better than the ordinary Upland cotton and brings a somewhat higher price.

While not to be classed as an early variety, the plant of the Triumph variety sets its crop in good season and matures the bolls so early that a large proportion escapes injury from the boll weevil. Mr. Mebane has averaged about one-half a bale to the acre for his entire plantation, although for several years past it has been badly infested with the boll weevil.

The Triumph variety originated on black, waxy land and is especially well adapted to that soil. It is rapidly gaining favor all through the weevil-infested region.

The strain distributed this year has been grown from about four plants selected at Mr. Mebane's place in the fall of 1904. The character sought in the selection has been increase in earliness without sacrificing the other valuable characters of the variety. This strain planted in 1906 in competition with seed bought of Mr. Mebane in 1904 showed a gain of about 15 per cent in earliness. It is also high in percentage of lint, the bales averaging this year about  $38\frac{1}{2}$  per cent.

The Triumph variety is briefly described as follows:

Plant strong and thrifty, beginning to fruit near the ground, close to the stalk, of stormproof type; limbs short jointed; bolls pendulous when mature, large, ovate, blunt pointed, 5 locked, opening wide and easy to pick; seeds medium in size, fuzzy or tufted, well covered; lint white, 1 inch to  $1\frac{1}{2}$  inches long and of good quality; percentage of lint, 37 to 39; season of maturing medium early.

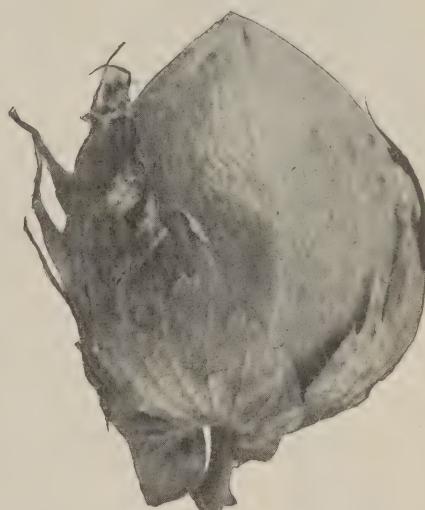


FIG. 2.—Mature boll of Triumph cotton.

The seed for this distribution was grown by Mr. J. D. Kimbrough, of Palestine, Tex., under the supervision of the cotton laboratories of Cotton and Tobacco Breeding Investigations of the Bureau of Plant Industry.

#### TRING.

(Distribution arranged by D. A. Saunders.)

The Tring is a hybridized cotton (fig. 3), King being the pollen parent and Triumph the seed parent. The cross was made in the summer of 1904 on the farm of Mr. A. D. Mebane, Lockhart, Tex., by

the late A. W. Edson, of the Bureau of Plant Industry. The work has been carried on since the first year by D. A. Saunders. The first generation was raised at Lockhart, Tex., in 1905, and the succeeding ones at Smithville, Cuero, and Waco, Tex.

The object sought in making the hybrid was to obtain an early-fruiting cotton with a good quality of lint and a large boll. Of the original 20 hybrid bolls, all but 4 were discarded in the second generation on account of small size of boll, poor quality of lint, or unproductiveness. The next year the progeny of all but one (No. 254g) were discarded, and many selections were made from that one. These selections have been increased sufficiently to make a small distribution. Owing to the fact that the variety is a hybrid and has been selected but three years, there is some variation in size of boll and length of lint. In size of boll it compares with its parent varieties about

as follows: Average size of King bolls, 89 to the pound of seed cotton; of Triumph, 54; and of Tring, 62. The Tring variety is described as follows:

Plant medium height, 2 to 4 feet, with many fruiting branches; fruiting branches long, drooping, short jointed; foliage dark green, medium to small, hirsute; flowers cream colored, with an occasional trace of petal spot; bolls medium to large, ovate, 4 or 5 locked; lint  $\frac{3}{8}$  to 1 inch long, uniform, abundant; percentage of lint, 25 to 27; season early.

The seed used for this distribution was grown by Mr. Louis Burns, Cuero, Tex., and by Mr. J. C. Morriss, Waco, Tex., in the season of 1907 under the direction of the cotton laboratories of Cotton and Tobacco Breeding Investigations of the Bureau of Plant Industry.

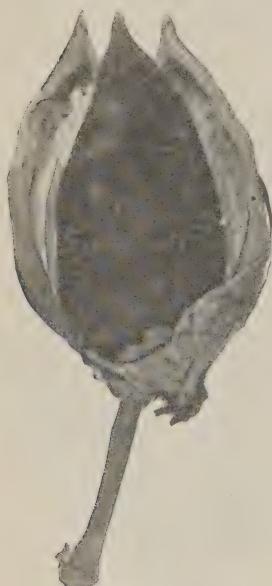


FIG. 3.—Mature boll of Tring cotton.

## CRENSHAW.

(Distribution arranged by D. A. Saunders.)

The Crenshaw variety (fig. 4) was obtained by a cross between the Triumph and the Jones Prolific variety<sup>a</sup> made in the season of 1904 at Terrell, Tex. Jones Prolific, the pollen parent, is an early-maturing, medium-bolled cotton, yielding an exceptionally high percentage of lint. The object in making the cross was to obtain an early-maturing cotton with a high percentage of lint and a large boll. The variety has shown itself very promising from the first. While it is not entirely uniform as yet, it has given such satisfactory yields that it seemed best to distribute it at this time. A short description follows:

Plant robust, large, 3 to 5 feet high, with one to three typical primary branches; fruiting branches many, long, short jointed below to long jointed above; foliage medium to large, dark green, open; bolls medium to large, 1 to  $1\frac{1}{2}$  inches in diameter, very obtuse at apex, on medium long stems; lint seven-eighths to 1 inch long, very strong; percentage of lint about 38.

The seed distributed by the Department of Agriculture was grown under the supervision of the cotton laboratories of Cotton and Tobacco Breeding Investigations of the Bureau of Plant Industry by Mr. John Gorham, near Waco, Tex., in the season of 1907.



FIG. 4.—Mature boll of Crenshaw cotton.

## PEDIGREE PRIDE OF GEORGIA.

(Distribution arranged by H. J. Webber.)

Pride of Georgia (fig. 5) is a big-bolled Upland cotton, originated by Mr. James F. Jones, near Hogansville, Troup County, Ga., about 1901. It was produced by selecting especially fine early stalks from the Jones Improved cotton, the first selection being made in 1900. The seed was carefully selected again in 1901 and 1902. The variety is described by Mr. Jones as similar to the original Jones Improved, but inclined to fruit and mature earlier.

A variety plat of the Pride of Georgia cotton from select seed purchased from Mr. Jones was grown at Columbia, S. C., in 1903, and in

<sup>a</sup> Jones Prolific is a variety originated in Texas, and not at all related to Jones Big-Boll cotton of the eastern cotton States.

the course of the experiments conducted by the Bureau of Plant Industry it was found to be one of the best varieties tested. In considering all characters it was thought to be the best early big-bolled race tested, and accordingly a number of selections were carefully made of the best-producing early plants. These were planted in a breeding patch in 1904, the progeny of each selected individual being planted separately. Individual selections were made from the best progenies of these, which were again planted in 1905, in a special breeding patch. The selections were continued in the same way in 1905 and 1906. After the individual selections were removed from

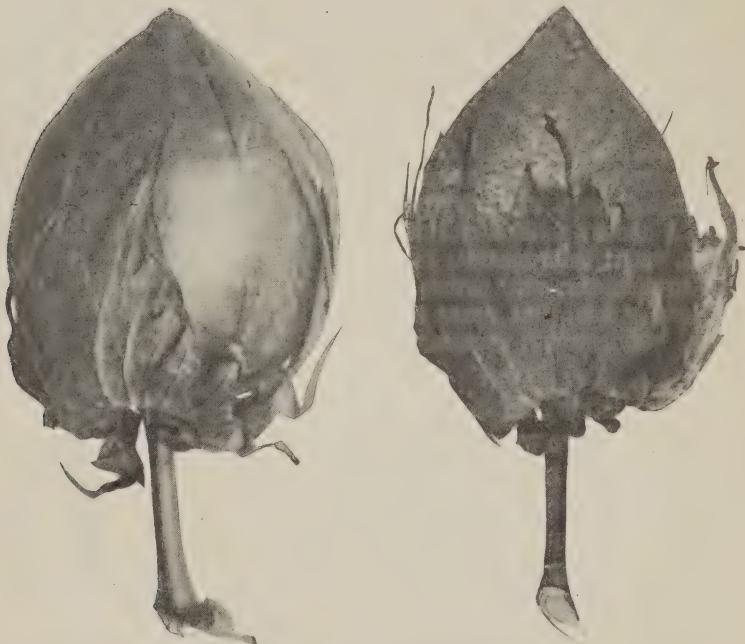


FIG. 5.—Mature boll of *Pride of Georgia* cotton.

FIG. 6.—Mature boll of *Peterkin* cotton.

the breeding patch of 1906 the remaining portion of the breeding-patch seed was retained for planting a multiplication plat in 1907, following out the method of seed selection pursued by the best plant breeders.

It is the seed from this multiplication plat which is being distributed in 1908. The seed is thus more carefully selected than that usually placed in the hands of growers and should give good results. The breeding of this variety for higher production is being continued by the best improved methods, and each year seed of a higher degree of perfection will be furnished for the Department's distribution. It is certainly one of the earliest and most prolific of the big-bolled cottons and is especially adapted to the cotton sections of Georgia

and South Carolina. Its adaptability to central and western sections of the cotton belt has not been thoroughly determined.

A short description of the race follows:

Plant low, stocky, vigorous, and prolific, of Truitt type, with two to four wide-spreading horizontal branches from near the base; bolls round to ovate, very large, 5 locked; seeds tawny, fuzzy or tufted, medium size, well covered with lint, 8 to 9 per lock; staple 1 inch in length, white, very strong, good in uniformity and of medium fineness; percentage of lint, 32 to 34; season of maturity early.

The seed of this variety distributed was grown by Mr. R. C. Keenan, of Columbia, S. C., under the immediate direction of the Bureau of Plant Industry.

PETERKIN.

(Distribution arranged by  
E. B. Boykin.)

This cotton (fig. 6) is a short-staple Upland variety, originated by Mr. A. J. Peterkin, of Fort Motte, S. C. For a number of years Mr. Peterkin has been carefully selecting and improving this variety, and it is probably one of the most widely cultivated short-staple Upland cottons.

The plants grow tall and branching and have very thin foliage. The bolls are somewhat pointed and open well, but are only fairly stormproof. The lint is about an inch in length and the percentage of lint is about 38 to 42. This is considered by many growers to be its most desirable character. The seeds are very small and some of them are smooth and black.

The seed used for this distribution was grown by the originator in the season of 1907.

LEWIS PRIZE PROLIFIC.

(Distribution arranged by E. B. Boykin.)

The Lewis Prize Prolific is a short-staple Upland variety (fig. 7) originated by Mr. W. B. F. Lewis, of Lewiston, La. For the last four years it has been carefully selected by Mr. J. W. Fox, of Green-

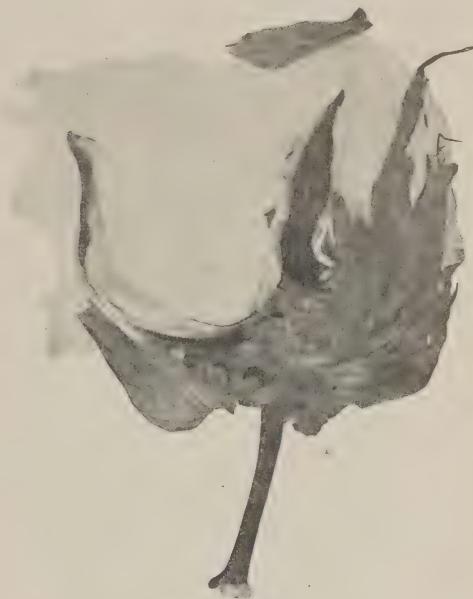


FIG. 7.—Mature boll of Lewis Prize Prolific cotton.

ville, Miss., for the purpose of increasing its productiveness. It has in this way been developed into a very productive variety and will, no doubt, prove valuable for certain localities.

The plants of this variety grow rather tall and are semicluster in type. They begin fruiting early in the season and continue until frost. This tendency to extend the fruiting period is considered by some growers as one of its chief merits. The variety seems to be resistant to drought and to be able to endure an unusual number of unfavorable conditions.

The Lewis Prize Prolific variety produces medium heavy foliage and round bolls of medium size, which open well and are stormproof. The length of lint is from 1 inch to  $1\frac{1}{6}$  inches and the percentage of lint is from 27 to 38. The seeds are rather small and greenish in color.

The seed used in this distribution was grown by Mr. J. W. Fox, of Greenville, Miss., in the season of 1907.

#### LONG-STAPLE UPLAND VARIETIES.

##### COLUMBIA.

(Distribution arranged by H. J. Webber.)

In the course of the cotton-breeding experiments which were formerly conducted by Dr. Herbert J. Webber for the Bureau of Plant Industry special attention was given to producing new and improved long-staple Upland varieties. One strain which has been under very careful selection for six consecutive generations, at Columbia, S. C., has shown very marked improvement and was last year named the Columbia. (Fig. 8.)

The following is a short statement of the methods used in producing the variety. In the summer of 1902 a plat of Russell Big-Boll cotton was grown in connection with Doctor Webber's experiments for the purpose of testing the variety in comparison with other sorts and making selections. Every plant in the plat was carefully examined and the lint combed to determine its length. The length of lint was found to be somewhat variable, in general being from 1 inch to  $1\frac{1}{8}$  inches. About half a dozen plants were found with lint nearly  $1\frac{1}{4}$  inches long, and one particularly good plant had lint averaging about  $1\frac{3}{8}$  inches in length.

Several of the best plants that had long lint were planted in 1903 by the plant-to-row method. An examination of the rows when the plants matured brought out the fact that the one plant selected in 1902 that had lint  $1\frac{3}{8}$  inches long had reproduced its characters in a marked degree, while the rows planted from the seed of the other plants were only slightly better than the ordinary Russell cotton. The selections made in 1903 were therefore all taken from the progeny of this one superior plant. About 75 per cent of these plants pro-

duced lint  $1\frac{1}{4}$  inches in length, and about 12 plants gave lint nearly  $1\frac{3}{4}$  inches long. Seed was preserved only from the 12 best plants, and these were planted in an isolated plat in 1904 by the plant-to-row method. In 1904 several of the rows of plants were much below the standard set and only one of the rows was considered superior. All of the selections in this season were made from this superior progeny. In 1905 an isolated patch of about  $1\frac{1}{2}$  acres was planted again by the plant-to-row method. In this season the variety had been reduced to practical fixity of type, and the breeding patch was exceptionally fine and fairly uniform. In 1905 some individual selections were made, after which a considerable number of good second select plants were marked and saved for seed to plant a multiplication patch in 1906.

In 1906 a multiplication patch of 14 acres was planted with this second select seed, and this patch produced 25,500 pounds of seed cotton and 7,395 pounds of lint, or 1,821 pounds of seed cotton and 528 pounds of lint to the acre. The lint sold on the market at Columbia, S. C., early in the season at 13 cents a pound. Had it been sold in a long-staple market later in the season, it would have brought a much higher price. The lint from the breeding patch of 1906 sold later in the season for  $19\frac{1}{2}$  cents.

In 1907 a multiplication patch of 20 acres was planted with the Columbia variety, and it is the seed from this field which is being distributed the present season.

Throughout the selection the aim has been to select plants having the Russell type of branching and boll, so that the plant of the Columbia is scarcely recognizable as distinct from the Russell variety. The very large boll has also been retained and the variety is in every respect of true Upland type aside from its lint character.

The true Russell variety produces a large seed covered with dark-green fuzz. This character is very undesirable, owing to the discoloration of the lint if ginned while somewhat wet by the pulling off

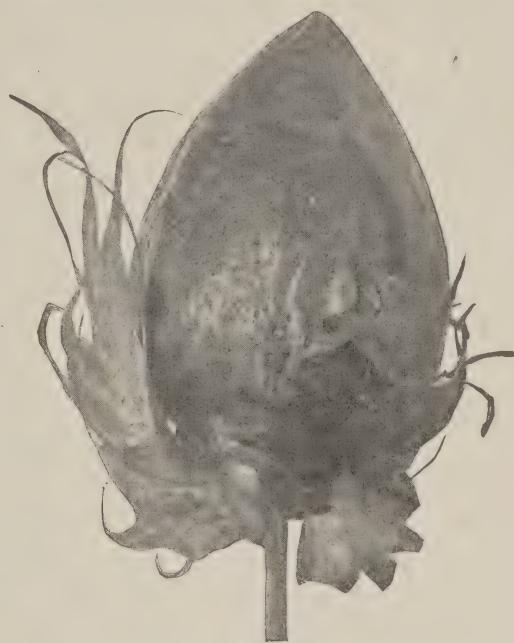


FIG. 8.—Mature boll of Columbia cotton.

of the green fuzz, and also owing to the green color giving undesirable linters. In the selection, therefore, special attention has been given to selecting a white seed. The great majority of the plants of the Columbia variety now produce white seed, but this character has not as yet been entirely fixed.

While the variety is now one of the best long-staple Upland sorts, it requires to be further improved in some characters. As will be seen from an examination of the yields of the 14-acre patch, the lint turnout was only 29 per cent. In increasing the length of lint there has been a slight loss in the percentage of lint. The Russell variety, however, seldom averages more than from 30 to 31 per cent, owing to its very large seed. Practically speaking, this can not be considered a serious drawback to the variety if the yield of lint to the acre holds up, and it is believed that the yield to the acre will average as high as that of ordinary short-staple sorts grown under the same conditions.

In the selection of the variety up to the present time little attention has been given to increasing the percentage of lint. In the selections made in 1906, however, this feature was made one of the important points. It was found that the different selections varied in percentage of lint from 29 to 34 $\frac{1}{2}$ . All of the selections from one row of plants averaged from 32 to 34 per cent.

The crop of 1907 showed a marked increase in the percentage of lint over that of 1906, and it is certain that the variety is greatly improved in this respect. Great care has been exercised to select seed plants having very strong lint, and as a result the initial strength of the lint in the Columbia is much greater than in Griffin, Sunflower, and the majority of the long-staple Upland varieties.

The tests of the Columbia variety made at various places in 1907 show that in some places it is a thoroughly satisfactory cotton, while under other conditions it may prove somewhat disappointing. This is what would naturally be expected. Any long-staple cotton to give thorough success should be planted on fairly good soil, rich in vegetable matter, and must be well manured and well cultivated. Such thorough methods will pay.

Doctor Webber has had considerable experience with the long-staple Upland cottons, having grown and tested practically all of the known varieties, and, considering all characters, he believes the Columbia to be one of the most promising varieties of this class of cotton. He strongly recommends growers to give this cotton a thorough trial for several years, being careful to select the seed for planting in accordance with the method suggested earlier in this paper.

Following is a short technical description of this variety:

Plant low, compact, of Russell type, having several long, branching basal limbs, vigorous and prolific; bolls large to very large, ovate, blunt pointed,

opening very wide, mainly 5 locked; seeds large, fuzzy, white or greenish, 8 to 10 per lock; lint very strong, from  $1\frac{7}{8}$  to  $1\frac{3}{4}$  inches in length, fine, silky, and very uniform in length; seeds moderately well covered, giving from 29 to 33 per cent of lint; season of maturing medium.

The field of Columbia cotton from which the seed distributed this season was taken was grown by Col. D. J. Griffith, superintendent of the State penitentiary at Columbia, S. C., under the direction of the Bureau of Plant Industry.

#### KEENAN.

(Distribution arranged by H. J. Webber.)

The Keenan is a second long-staple variety (fig. 9) which has been originated in the course of Doctor Webber's experiments and gives promise of being a valuable variety for general cultivation. This variety has been named in recognition of the valuable assistance which Mr. R. C. Keenan, of Columbia, S. C., has given in various cotton-breeding experiments. The variety has been grown and selected on Mr. Keenan's plantation and largely at his private expense.

The following is a short statement of the methods used in producing the variety:

In the summer of 1903 a plat of Jones Improved cotton was grown from special seed sent to the Department of Agriculture by Mr. J. F. Jones, of Hogansville, Ga. Doctor Webber's experience with the Columbia cotton, the first plants of which had been selected the preceding year (see the description of Columbia cotton in this circular) had led him to question how much variation in length could be found in the ordinary short-staple cottons, and all of the plants of this plat of Jones Improved cotton were thus examined to determine the variation in length of lint. While the majority of the plants were found to have lint only about 1 inch in length, a few plants were found which had lint from  $1\frac{1}{8}$  to  $1\frac{3}{4}$  inches long. Plants having such long lint to the number of 28 were selected and planted the next season by the plant-to-row method. An examination of the



FIG. 9.—Mature boll of Keenan cotton.

progenies of these 28 plants showed that the majority had not transmitted the character of long lint in any marked degree, but 9 of them were found to have shown fairly strong transmitting power, and selections were made from these progenies. In the ensuing year the selections were limited to 6 of these progenies, all of which seemed to have reproduced the desired type of lint and plant. The selection, now in its fifth year, seems to be fairly fixed in type and has held up uniformly in its important characters. It is a big-bolled type, fairly early in season, and has lint averaging about  $1\frac{1}{4}$  inches in length.

Following is a short technical description of the variety:

Plant of Jones Improved type, robust, vigorous, and prolific; usually with several long basal branches and a central stem with comparatively short lateral branches; bolls large,  $1\frac{3}{4}$  to 2 inches long, ovate, blunt pointed; 4 to 5 locked, mainly 5 locked, opening well; seeds 7 to 10 per lock, medium large, grayish, fuzzy, ordinarily well covered; lint fine, white,  $1\frac{3}{16}$  to  $1\frac{1}{8}$  inches in length, averaging about  $1\frac{1}{4}$  inches; percentage of lint, 31 to 32 under ordinary conditions; season, medium early.

The Keenan cotton has lint which is slightly coarser and shorter than that of Columbia and has a tendency to be lacking in uniformity in length on the seed. The variety, however, has excellent lint as a whole, and is prolific, opens well, and is fairly early. Tests under the conditions existing at Columbia, S. C., indicate that it is a variety of considerable promise.

It requires to be further improved by selecting to secure a more uniform length of lint, this character yet remaining rather too variable.

The seed of this variety distributed was grown on the plantation of Mr. R. C. Keenan, Columbia, S. C., under the direction of the Bureau of Plant Industry.



FIG. 10.—Mature boll of Southern Hope cotton.

The variety known as Southern Hope (fig. 10) is stated by Prof. S. M. Tracy to

have been originated by Col. F. Robieu, of Louisiana, from seed said to have come from Peru. It is one of the old varieties, but after being in cultivation for a quarter of a century still remains a favorite in some sections and has been preserved nearly pure by a number of cultivators.

#### SELECT SOUTHERN HOPE.

(Distribution arranged by H. J. Webber.)

There is a growing opinion that cottons of a better staple than those ordinarily grown should be more extensively cultivated. In some sections a prejudice exists against the growing of varieties of long-staple cotton, but this is mainly directed against the varieties with a staple of from  $1\frac{1}{2}$  to  $1\frac{5}{8}$  inches in length. The varieties of medium-long staple, like the Southern Hope, yield nearly or quite as heavily as the ordinary Uplands and always sell at a considerable premium over the short-staple cottons. This variety has for the last three years been carefully bred in the experiments of the Bureau of Plant Industry by systematic pedigree methods to increase the yield and improve the lint. The limited quantity of seed distributed is from the breeding patch and should therefore be of particularly good quality. The variety is an excellent early sort, producing fine lint.

A short technical description follows:

Plant pyramidal, spreading, open, rather long jointed; bolls 4 and 5 locked, medium size, ovate, blunt pointed, opening well, and easy to pick; seeds medium size, white, fuzzy, or tufted; lint white, averaging  $1\frac{1}{4}$  inches in length, fine, and fairly strong; percentage of lint to seed cotton, 30 to 32; season of maturing, medium.

The seed distributed by the Department of Agriculture this season (1908) was taken from a field planted with carefully selected seed at Columbia, S. C., in 1907.

#### **METHODS OF CULTIVATION AND GINNING.**

##### **SHORT-STAPLE UPLAND VARIETIES.**

The methods of cultivation which should be pursued in growing the varieties of short-staple Upland cotton distributed are the same as those used for any ordinary Upland cotton. No exact directions can be given with respect to the distance apart of the rows or the distance between the plants in the row, as the space required by each plant is determined by the fertility of the soil in each case. The varieties distributed are all quite similar in size and habit of the plant. Under ordinary conditions satisfactory results would be obtained with them by planting the rows 4 feet apart and the plants from 18 to 24 inches apart in the row. On rich soil this distance should be somewhat increased, while on sterile land closer planting is desirable.

##### **LONG-STAPLE UPLAND VARIETIES.**

These varieties of long-staple Upland cotton, while producing a medium long, fine staple, are in size and general appearance of plant very similar to ordinary short-staple varieties, and the same cultural methods are to be recommended as are used with the ordinary short-

staple sorts. In picking, handling, and ginning, however, more care is required if the highest market price is to be realized. Greater care should be exercised in picking to avoid getting the fiber mixed with fragments of leaves, bolls, and twigs. Fiber from immature and weather-stained bolls should also be rejected. Pickers accustomed to picking ordinary cotton are likely to be careless in picking long-staple cotton, owing to their endeavor to gather large quantities and increase their wages. In fine grades of long-staple Upland cotton it would probably also be found desirable before storing it to spread the seed cotton on a platform in the sun for a few hours to dry.

The difficulty experienced in properly ginning long-staple Upland cottons has been considered an obstacle to their general cultivation. It is generally recognized that long-staple Sea Island sorts should be ginned on a roller gin, as the saw gins tear and break the fiber to such an extent as to greatly reduce its value. It is also very generally supposed that the long-staple Upland cottons should be ginned on a roller gin, and this understanding has prevented many from attempting to grow these cottons, as roller gins are ordinarily only accessible to growers in regions where Sea Island cotton is cultivated. Experience has shown, however, that the long-staple Upland cottons may be ginned on ordinary saw gins if care is used in the process. Before ginning these cottons the gin saws should be sharpened square across the teeth and then dulled somewhat by use in ginning ordinary short-staple cotton. It is also important to run the gin at a lower rate of speed than in ginning ordinary short-staple cottons, 300 revolutions per minute being usually recommended. If these precautions are observed, the long-staple Upland cottons may be very satisfactorily ginned on an ordinary saw gin.

It is also important that growers of long-staple Upland cottons give special attention to the marketing of the product. In 1902 several bales of long-staple Upland cotton were sold to a buyer at a small interior town in South Carolina for 10 cents a pound, which were certainly equal to bales of similar cotton sold in the New Orleans market the week following at 15 cents, when ordinary cotton was selling at 8½ cents.

Many of the failures with long-staple Upland cotton have been due to the lack of experience on the part of the grower in the matter of marketing. Some buyers take advantage of the growers' ignorance, purchasing cotton for 10 cents that is worth 15 cents a pound and realizing the difference themselves. Until buyers inform themselves on the value of long-staple cotton and pay reasonable prices, it will have to be consigned to general long-staple markets, such as New Orleans, Memphis, or Vicksburg, or to some of the large New England markets, such as Providence or Boston.

The demand for long-staple Upland cotton is rapidly increasing, and doubtless the area cultivated in this type of cotton will be very greatly increased in a few years. Good grades, with a staple averaging about  $1\frac{1}{2}$  inches, sold the present season as high as 21 and 22 cents a pound, which is as much as is commonly paid for ordinary grades of Sea Island cotton.

**REPORT OF RESULTS DESIRED FOR PUBLICATION.**

In order to determine the comparative value of the different varieties of cotton in various cotton-growing regions, the growers receiving this seed are requested to give it a thorough trial in comparison with the variety or varieties that they ordinarily grow and be prepared in the autumn of 1908 to report the results of the test to the U. S. Department of Agriculture. A report will then be requested covering the following points:

- (1) Character of the soil.
- (2) Character of the season.
- (3) Total yield of seed cotton produced. (Determined by actual weighing.)
- (4) Total yield of lint produced. (Determined by actual weighing.)
- (5) Size of patch grown. (Determined by actual measurement.)
- (6) Yield per acre. (Estimated from the patch grown.)
- (7) Rating of the variety for your section—whether excellent, good, fair, or poor.
- (8) Name of the variety ordinarily grown by the planter making the test.
- (9) Yield of ordinary variety this year on same soil as the variety under consideration.

It is especially requested that growers carefully note the points enumerated above in order that they may secure the necessary data and be ready to supply accurate information when it is called for next autumn. If sufficiently accurate data are furnished, a report will be compiled and issued giving the results of the various trials in all sections, and this report will be sent to all planters cooperating in the experiment. In this way it is hoped to obtain valuable and reliable information regarding the varieties best adapted to various sections of the cotton belt.

Growers receiving this seed who are willing to cooperate with the Department of Agriculture in making the above test are requested to fill in and return the accompanying franked postal card, which requires no postage.

D. N. SHOEMAKER,

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